12-2014

Poverty Effects on Student Achievement: A Look at Chicago Public Schools

Lisa Breger
Southern Illinois University Carbondale, lbreger@siu.edu

POVERTY EFFECTS ON STUDENT ACHIEVEMENT: A LOOK AT CHICAGO PUBLIC SCHOOLS

by Lisa Breger

A Research Paper

Submitted in Partial Fulfillment of the

Requirements for the Master of Arts

Department of Economics

Southern Illinois University Carbondale

December 2014

RESEARCH PAPER APPROVAL

POVERTY EFFECTS ON STUDENT ACHIEVEMENT: A LOOK AT CHICAGO PUBLIC SCHOOLS

By

Lisa Breger

A Research Paper Submitted in Partial

Fulfillment of the Requirements

for the Degree of

Masters of Arts

in the field of Economics

Approved by:

Dr. Subhash C. Sharma, Chair

Dr. Alison Watts

Graduate School

Southern Illinois University Carbondale

11/3/2014

AN ABSTRACT OF THE RESEARCH PAPER OF

LISA BREGER, for the Master of Arts degree in ECONOMICS, presented on October 31, 2014, at Southern Illinois University Carbondale.

TITLE: POVERTY EFFECTS ON STUDENT ACHIEVEMENT: A LOOK AT CHICAGO PUBLIC SCHOOLS

MAJOR PROFESSOR: Dr. Alison Watts

This paper investigates the relationship between poverty and school performance in Chicago Public Schools. This paper uses a sample of 495 schools in the City of Chicago school district, with both regular public schools and charter schools. Data is comprised of various demographic measures, including percentage of students eligible for free or reduced lunch, which serves as a proxy for measuring poverty level among students. We use ordinary least squares to estimate the effect of poverty, and other school-level characteristics, on school achievement on the Illinois Standards Achievement Test (ISAT). We find that poverty has a significant negative impact on achievement. We also find that, controlling for demographic population, increasing both attendance rates and school size could improve achievement on test scores.

TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

Introduction

Standards based education in the United States has aimed at improving our schools and raising accountability among teachers, administrators, and students. Public schools across the country have experienced a reform movement that has, in many cases, put immense pressure on students to perform better on state tests and on teachers to expand their curriculum to better prepare their students. This paper investigates how well schools are performing, per state and federal standards, and considers how various school-level characteristics can explain the overall success of a school in meeting these standards.

The main objective of this paper is to shed light on which school-level characteristics are proponents for school success using cross-sectional data from the 2013 school year for 495 public schools in the Chicago Public School district. Using such data will give an indication as to whether current year characteristics of the school have a significant impact on test scores and achievement, or lack thereof. We are mainly interested in poverty effects and would like to investigate how school-level poverty determines the overall performance of a school on the ISAT. We would expect poverty to play a significant role and find that the percentage of students who qualify for reduced cost meals is statistically significant for test scores in all subject matters. As the poverty level of a school increases, achievement on the ISAT is lower.

Prior research implies that it may be worthwhile to categorize school-inputs based on whether administrative policy can control the input or not. For example, in this research, we categorize school size, attendance rates, and charter school as control inputs, since administrators have some degree of control over these. Likewise, schools' demographic population and poverty levels among students cannot be changed or controlled by way of administrative policy. By classifying variables in this manner, we can easily see some policy implications based on which

school-level inputs are significantly impacting achievement. Therefore, a second objective of this paper is to analyze the potential effectiveness of school policy variables on achievement, controlling for demographic makeup of schools. We find that both attendance rates and school size significantly impact test scores and that charter schools also perform worse as a whole on the ISAT.

Literature Review

In recent years, school accountability has become the focus of attention for many educational leaders and reformists. The passing of the No Child Left Behind (NCLB) Act of 2001, which is an extension of the Elementary and Secondary Education Act of 1965, has brought wide debate in terms of monitoring school progress and measuring performance of both students and teachers. This legislature is the main advocate for standardized testing across states and aims toward holding teachers and administrators more accountable for student success, which is a controversial debate within education reform. The degree to which schools can be penalized, in terms of receiving academic financial aid, for performing poorly on a consistent basis may be hurting those who need academic aid the most (Krieg and Storer, 2006). These authors find that poor performance, measured by the state standard "Adequate Yearly Progress" (AYP), of schools is largely due to student and family characteristics rather than school inputs that can be controlled by administration. It is also worth mentioning that sanctions on schools for not meeting AYP, while noble in intention, are often ineffective in promoting improvement or are not attached to appropriate support mechanisms through which schools can afford change (Murnane and Papay, 2010).

Part of meeting these national requirements means passing state standardized tests, such as the ISAT. But can curriculum-based standardized exams improve achievement? Bishop

(1997) reviews evidence on a cross-national scale and finds that the only state in the U.S. that uses curriculum-based exit exams (CBEEs) to evaluate student achievement, New York state, does in fact perform well on the SAT when demographic variables are held constant. This research is supportive of the hypothesis that raising national standards in the form of using standardized tests will improve achievement.

In the midst of this debate lies another interesting aspect of school reform. In the early 90's, charter schools began popping up across the country, and continue to gain popularity as parents and educators search for answers to improve U.S. education. Charter schools are an alternative educational institution that are supported by public funding, but operate independently. Charter schools act largely like a public school, but the standards by which they operate can be very different across states. A very natural question to ask is whether charter schools have a significant impact on student performance as compared to their neighboring traditional public schools. Bettinger (2005) finds in a study conducted over Michigan public and charter schools that students attending charter schools may actually experience a decline in standardized test scores. A comprehensive study on Illinois charter schools finds that there are greater shares of students in poverty, as well as higher proportions of black and Hispanic students, attending charter schools. The study also reveals that students in poverty experience significant learning gains in reading when they attend a charter school (CREDO report, 2013). As data on charter schools becomes more available, these results can be tested more thoroughly. In this paper, we will use a dummy for charter schools to evaluate whether charter schools are performing better on average versus regular public schools.

The charter school debate raises a question concerning school choice. That is, when parents have the option to choose between two or more schools for their child, how will this

"competitive" atmosphere between schools be reflected in school quality? One study uses real estate prices within school districts to determine the value that parents place on high performing schools by looking at housing prices in areas where families have a choice between at least two elementary schools. They find that parents are willing to pay 2.5% more on average for their property when the school their child attends has 5% higher test scores (Black, 1999). This study is further evidence that school quality matters to parents, and educational policy that improves achievement could have significant impacts on a state in terms of economic development.

One important question that economists are interested in is how to effectively measure academic performance, both at the student level and school level. Most researchers choose to use a production function approach to measure the "output" of a school in terms of state standardized test scores, including inputs such as teacher quality and school spending, among others. This stream of literature was largely informed by the Coleman Report (Coleman et al., 1966), where Coleman uses various school resource inputs as well as external inputs (i.e. community, parents, background) to evaluate their effect on student outcomes. Coleman reported interesting findings that student success is more closely related to family background rather than school-specific inputs. However, other studies have continued using school-specific inputs with micro data to further address the impact of teachers and schools on student outcomes (Hanuskek, 1996; Caldas and Bankston, 1997). For criticisms on input-based schooling policies, see (Brown and Saks, 1975; Hanushek, 2003). For the purpose of this paper, we use both school-specific inputs and demographic and community data.

A major area of consideration in educational research is the effect of poverty on student performance. Micro level data has offered some insight on how low-income populations perform relative to their higher income counterparts. Andrews et al. (2003) finds that poverty is

significant in determining educational performance at the school level. This study estimates poverty effects for 817 K-8 schools in the Mississippi Delta region of Louisiana, using percent of students on reduced cost meals as a proxy for a poverty measure. These authors also consider school size as an important variable affecting school-level success (Andrews et al., 2003). Further literature has also supported the hypothesis that poverty negatively influences achievement (Brooks-Gunn and Duncan, 1997; Caldas and Bankston, 1997; Duncan et al., 1972). We will use similar methods in estimating poverty effects. Namely, percentage of students qualifying for free or reduced lunch is used as a proxy for poverty. Here, however, 495 schools in the Chicago Public School district are considered, and we estimate poverty and school size effects in the presence of other demographic variables such as race/ethnicity, and special education and bilingual population.

Other research suggests that welfare programs that boost family income affect children's achievement, but the overall effect depends on their developmental stage (Clark-Kauffman et al., 2003). One commonality in these research studies is that the authors use percentage of students who qualify for free or reduced lunch as an indicator of poverty, while some researchers consider an aggregate measure of socioeconomic status (SES) that in some way includes free or reduced lunch eligibility. It is also possible to consider SES measures at the community or neighborhood level (versus the school-level), in which case, researchers use census data that indicates the proportion of adults over 20 years old who have not completed high school (Sirin, 2005). For the purpose of this paper, we conform to traditional methods and use free or reduced lunch eligibility.

In deciding which independent variables to include as valid inputs to the production function of schools, student attendance and school size are sometimes overlooked. Lamdin

(1996) indicates in a study using data from Baltimore public schools that student attendance is significant in student scores on standardized tests, and also reports that socioeconomic factors are apparent. Driscoll et al. (2003) finds that school size affects standardized test scores at the elementary level, while there are mixed results at the secondary level. Overall there are mixed results concerning the effect of school size on academic performance (Hicks and Rusalkina, 2004). While these results may remain mixed, school size, as measured by enrollment, is found to be positively and significantly related to subsequent earnings (Betts, 1995).

As noted above, the data for this paper includes school-level demographic data that indicates the proportion of students who are African American, Hispanic, bilingual, and special education students. There is no doubt that achievement gaps between white and non-white students has garnered attention, specifically in looking at how segregation in schools affects achievement gaps (Echenique et al., 2006). While this paper does not attempt to explain such achievement gaps, there is evidence that school-inputs–specifically school spending–provide little explanation for variations in test scores between blacks and whites (Hanushek, 2001). However, the use of racial composition of a school in this paper is important when dealing with test scores as a school outcome, since schools are required to meet minimum standards per each racial subgroup as well as at the school-level as a whole (Kane and Staiger, 2002).

Methods and Data

Data for this analysis was made available by the Chicago Public School system (CPS) and includes 495 public schools, listed as either charter or regular, that vary in academic outcomes (test scores), poverty levels, school size, attendance rates, and demographic composition.

Data is cross-sectional and reports measures from the academic year 2012-2013. Test scores are representative of the school's overall performance, and indicate the percentage of students who *failed to pass* the ISAT exams in reading, mathematics, and science. Demographic and other data is reported in terms of proportion of total student population; these data include African American, Hispanic, Bilingual, Special Ed, Attendance rates, and Poverty (FRL). Poverty (FRL) represents the percentage of student population that is eligible for free or reduced lunch.

An alternative way to measure poverty levels is to consider the percentage of households that fall below the poverty line in the same community that the school resides, which we label Poverty (%HHBelow). Table 1 shows summary statistics for all variables used. Notice that the average poverty level when considering reduced cost meals is about 84%, while the average poverty level when considering households is only 23.5%. Because of this large difference, analyzing the results of two regressions with different proxies will provide better intuition on how poverty affects achievement.

A potential problem occurs when using community level data on households as an indicator of poverty. Here, we are assuming that the students attending a particular school in a particular community with low (high) income are actually residents of that same community. In this analysis, this assumption is reasonable, given that most students attend schools that they live close to, rather than traveling out of district to attend a different school. Nevertheless, we keep in mind that there may be a mismatch between students and schools when considering household poverty across communities.

Other variables of interest are Adequate Yearly Progress (AYP) and Years on Academic Watch (Watch). The first is a dummy variable and indicates whether a school met adequate

yearly progress (1), or not (0). The latter is simply the number of years that a school has failed to meet AYP, and therefore, represents some degree of persistence in school performance. These outcomes are just another way to measure school performance. AYP is the measure by which schools are held accountable for student performance under Title I of the No Child Left Behind Act of 2001. While AYP requirements may vary slightly from state to state, the primary requirement is that schools achieve at a certain level on state standardized tests. In Illinois, this passing threshold is based on the number of questions answered correctly, and was recently bumped up from a score of 13 to a score of 30 points. However, the exact passing scores vary by test and grade level. In addition, at least 95% of each sub-population of the school must have taken the test. Table 1 shows that the failing rates in reading and math are about 40% and slightly less at 20% for science.

Evaluating school performance in terms of "good" or "bad" might help us understand how schools react to state and federal standards. For example, we can see that out of 455 schools that have reported AYP, only about 57 schools have met this standard in the year 2013. This means that a great majority of the schools in CPS are "failing" and face consequences like restructuring of the school (i.e. curriculum, teaching staff, administration changes), which would be very costly. Even worse, schools who fail to meet AYP face losing government financial resources (Krieg and Storer, 2006).

Table 1:

Descriptive Statistics

Variable	Mean	St. Dev.	Minimum	Maximum	Observations
Reading(%below)	42.173	13.299	0	70	492
Math(%below)	40.554	13.372	0	68.2	492
Science(%below)	20.884	10.797	0	5.4	484
Years on Academic Watch	5.3525	4.255	0	12	383
Adequate Yearly Progress	0.1253	0.3314	0	1	455
Poverty(FRL)	84.812	21.437	10	100	495
Poverty(%HHBelow)	23.521	10.626	3.3	56.5	495
% African American	49.429	42.829	0	100	495
% Hispanic	36.577	37.610	0	99.7	495
% Bilingual	15.467	17.834	0	71	495
% Special Ed	12.511	7.265	3	100	495
Charter	0.1252	0.331	0	1	495
School Size	613.51	364.29	58	4120	495
Attendance Rates	94.084	3.172	49.1	98.9	495

Results

We estimate the following linear regression models, where Y consists of the various school percentages of students who fail to pass the reading, math, and science exams. X is a matrix of control variables, including percentage of students who are African American, Hispanic, bilingual, or special education. OLS estimates of β are of primary interest because this paper is first concerned with poverty effects on achievement, and second, how school policy variables can work to improve outcomes.

$$Y = \alpha + \beta 1 * Pvrty(FRL) + \beta 2 * \ln(Size) + \beta 3 * Att + \beta 4 * Chrtr + \gamma X + \varepsilon \quad (1)$$

$$Y = \alpha + \beta 1 * Pvrty(HH) + \beta 2 * \ln(Size) + \beta 3 * Att + \beta 4 * Chrtr + \gamma X + \varepsilon \quad (2)$$

$$AYP = \alpha + \beta 1 * Pvrty(FRL) + \beta 2 * \ln(Size) + \beta 3 * Att + \beta 4 * Chrtr + \gamma X + \varepsilon \quad (3)$$

$$Watch = \alpha + \beta 1 * Pvrty(FRL) + \beta 2 * \ln(Size) + \beta 3 * Att + \beta 4 * Chrtr + \gamma X + \varepsilon \quad (4)$$

Equation (3) uses a logit model to estimate effects on Adequate Yearly Progress. In model (4), we estimate how Years on Academic Watch is affected by the same school-level inputs. Since "Watch" is a count variable ranging from 1 to 12, we use a Poisson regression to estimate the coefficients.

Ordinary least squares regression results reported in Table 2 indicate that poverty (measured by percentage of student population who qualify for free or reduced lunch) has a significant negative effect on ISAT scores in both reading, mathematics, and science. Recall that scores are reported as the percentage of students who fall below the minimum passing rate, so the positive coefficients indicate that as poverty among student population increases, the

percentage of the school population that fails the exam increases (and so achievement decreases as poverty increases).

Also, we can see that as attendance rates increase, there is a significant decrease in the failing rate in all subject matters. School size has a significant positive effect on achievement. These results are consistent with prior research (Lamdin, 1996; Driscoll et al., 2003) and overall support the hypotheses that larger size schools actually improve the rate of achievement, and that high attendance rates result in better test scores. The dummy variable indicating whether a school is a charter school only has a significant impact on math and science scores. Specifically, if a school is designated as a charter, the expected mean percentage of students failing the math (science) portion of the ISAT is about 3.25 (2.35) percent higher, indicating that charter schools in this sample are doing worse in mathematics and science. Keep in mind that charter schools in Chicago host a large number of students in poverty, which may explain this phenomenon. To more correctly evaluate the effect of charter schools it may be useful to use longitudinal data that measures growth in performance, while analyzing students who are both poor and attend a charter school.

The implication at large here is that school administrators can in fact exercise some control, however minor, over school achievement in the presence of uncontrollable factors such as poverty by creating incentives for students to attend class more often and making efforts to raise total school enrollment to a desirable level. That being said, it is apparent that school-level achievement is more largely affected by outside factors like poverty and racial composition. Also, the proportion of students who qualify for special education programs may bias test scores downward. However, special education is only significant at the 10% level for reading and math, and is not significant in the case of science scores.

In Table 3 we find similar regression results for model (2), where we use a community level poverty measure rather than a school-level measure. Here, the percentage of households that fall below the poverty line in the same community in which the school is located is used as a replacement for free or reduced lunch. We should expect that the estimates will be similar in significance and result in the same policy implications noted earlier for school administrators. The main notable difference in Table 3 concerning the significance of poverty is that math scores are no longer significantly impacted, and science scores are still affected, but at the 5% level of significance versus the 1% level in the previous model. Also, school size coefficients remain negative, but are only significant in the case of math and reading scores. Attendance rates are again significant for all subject matters.

An explanation for this slight difference in results is the problem of mismatching mentioned earlier. While a school might be located in a community with high poverty levels, this does not mean that the students attending that school are part of that poverty group. It may be the case that poor students in that community attend a school elsewhere, and so we see a change in significance levels when using neighborhood poverty data. In any case, the second regression model confirms the fact that attendance rates are significant no matter which proxy we use for poverty.

Table 2:

	Dependent Variable		
Independent Variable	**Reading Below**	**Math Below**	**Science Below**
Poverty (FRL)	0.351***	0.272***	0.169***
	(0.03)	(0.04)	(0.03)
African American	0.111***	0.165***	0.089**
	(0.03)	(0.03)	(0.03)
Hispanic	0.093***	0.114**	0.043
	(0.03)	(0.03)	(0.03)
Bilingual	0.093***	0.114**	0.130**
	(0.05)	(0.05)	(0.05)
Special Ed	0.119*	0.128*	-0.1
	(0.06)	(0.07)	(0.07)
Charter	1.737	3.253**	2.352*
	(1.16)	(1.25)	(1.19)
School Size	-2.786**	-2.705**	-1.630*
	(0.86)	(0.93)	(0.88)
Attendance	-0.644**	-0.707***	-1.602***
	(0.19)	(0.20)	(0.22)
Constant	79.03***	84.99***	160.7***
	(19.48)	(21.09)	(22.66)
Adj. R^2	0.6456	0.5891	0.4475
n	492	492	484

Note: Standard errors in parentheses.
*Significant at 10%
**Significant at 5%
***Significant at 1%

Table 3:

	Dependent Variable		
Independent Variable	**Reading Below**	**Math Below**	**Science Below**
Poverty (%HHBelow)	0.207***	0.027	0.141**
	(0.05)	(0.05)	(0.04)
African American	0.336***	0.374***	0.188***
	(0.02)	(0.02)	(0.02)
Hispanic	0.281***	0.271***	0.130***
	(0.03)	(0.02)	(0.03)
Bilingual	0.281***	0.286***	0.214***
	(0.05)	(0.05)	(0.05)
Special Ed	0.189**	0.151**	-0.06
	(0.07)	(0.07)	(0.07)
Charter	2.953**	4.567**	2.823**
	(1.26)	(1.32)	(1.21)
School Size	-1.750*	-1.968**	-1.097
	(0.93)	(0.98)	(0.89)
Attendance	-0.852***	-0.92***	-1.698***
	(0.20)	(0.21)	(0.22)
Constant	94.64***	103.66***	167.6***
	(21.29)	(22.33)	(23.04)
Adj. R^2	0.5755	0.5381	0.4284
n	492	492	484

Note: Standard errors in parentheses
*Significant at 10%
**Significant at 5%
***Significant at 1%

Table 4:

	Dependent Variable
Independent Variable	Adequate Yearly Progress
Poverty (FRL)	-0.011
	(0.01)
African American	0.011
	(0.01)
Hispanic	0.005
	(0.01)
Bilingual	-0.018
	(0.02)
Special Ed	-0.039
	(0.04)
Charter	-1.391*
	(0.72)
School Size	-0.858**
	(0.37)
Attendance	0.479***
	(0.12)
Constant	-40.64**
	(11.98)
Adj. R^2	0.1522
n	455

Note:Standard errors in parentheses
*Significant at 10%
**Significant at 5%
***Significant at 1%

Table 5:

	Dependent Variable
Independent Variable	Years Academic Watch
Poverty (FRL)	0.039***
	(0.00)
African American	0.006**
	(0.00)
Hispanic	0.005**
	(0.00)
Bilingual	-0.002
	(0.00)
Special Ed	0.005
	(0.00)
Charter	-0.738***
	(0.15)
School Size	0.364***
	(0.06)
Attendance	-0.053***
	(0.01)
Constant	0.104
	(0.99)
LR chi^2	462.12
Psuedo R^2	0.1715
n	383

Note: Standard errors in parentheses.
*Significant at 10%
**Significant at 5%
***Significant at 1%

The estimates for a logistic regression using AYP as the dependent variable are reported in Table 4. Here, we can see that poverty is no longer significant. That is, poverty does not decrease the log-likelihood that a school will meet adequate yearly progress. Significant factors here are charter schools, school size, and attendance rates. These results further confirm that school policy inputs can be a viable mechanism for improving school performance. While poverty is not significant in considering AYP in any one particular year, we see that it plays a significant role in determining AYP status over the course of time. To test the hypothesis that poverty affects long-term performance in meeting AYP, we turn to model (4).

For further analysis, we consider model (4), where the performance outcome of the school is the number of years in which they have failed to meet adequate yearly progress. Since the dependent variable is a count variable, we use a Poisson distribution to estimate coefficients reported in Table 5. Here, poverty remains to be a significant factor. With higher poverty levels, we can expect that a school has *consistently* performed poorly in terms of meeting federal standards. Based on this interpretation, the estimation results further confirm that poverty has a significant impact on school performance and that increasing attendance rates will improve achievement.

Summary and Conclusions

The results of this analysis provide some clear evidence that schools in the Chicago Public School district are largely affected by poverty, but that school policy may be effective in mitigating some of this negative influence by creating attendance incentives. With attendance rates as low as 49% in some schools, it is not surprising to see these schools struggling to meet the required standards. In light of previous literature, it remains unclear whether raising school enrollment numbers would benefit student achievement, but the general result of this paper is

that targeting school size could be a reasonable mechanism for improving test scores. After all, school climate could be greatly affected by school size, which in turn might help to create an environment that is optimal for learning.

As schools face increased pressure to meet state and federal standards, further analysis on school districts will help researchers understand how schools are reacting to the No Child Left Behind Act and what policymakers can do to stimulate academic improvement. For now, more studies on the performance of schools are warranted to find out how school characteristics affect performance. The increasing presence of charter schools and other alternative educational institutions will also open the door for future research.

REFERENCES

"Charter School Performance in Illinois." Center for Research on Education Outcomes, CREDO. Stanford University, Stanford, CA, 2013.

Andrews, D. et al. "Influence of Poverty on Educational Performance in Louisiana: Emphasis on the Mississippi Delta Parishes." *Southwestern Economic Review, Southwest Economic Proceedings*, 2003, 30, 35-44.

Bettinger, E.P. "The effect of charter schools on charter students and public schools." *Economics of Education Review*, 2005, 24(2), 133-147.

Betts, J.R. "Does school quality matter? Evidence from the National Longitudinal Survey of Youth." *The Review of Economics and Statistics*, 1995, 77(2), 231-250.

Bishop, J.H. "The effect of national standards and curriculum-based exams on achievement." *The American Economic Review*, 1997, 87(2), 260-264.

Black, S.E. "Do better schools matter? Parental valuation of elementary education." *Quarterly Journal of Economics*, 1999, 114(2), 577-599.

Brooks-Gunn, J. and G.J. Duncan. "The effects of poverty on children." The future of children, 1997, 7(2), 55-71.

Brown, B.W. and D.H. Saks. "The production and distribution of cognitive skills within schools." *The Journal of Political Economy*, 1975, 83(3), 571-593.

Caldas.J. and C. Bankston. "Effect of school population socioeconomic status on individual academic achievement." *The Journal of Educational Research*, 1997, 90(5), 269-277.

Clark-Kauffman, E. et al. "How welfare policies affect child and adolescent achievement." *American Economic Review*, 2003, 93(2), 299-303.

Coleman, J.S. et al. "Equality of educational opportunity." *Washington, DC*, 1966, 1066-5684.

Driscoll, D. et al. "School district size and student performance." *Economics of Education Review*, 2003, 22(2), 193-201.

Duncan, O.D. et al. "Socioeconomic background and achievement." *Seminar Press*, 1972.

Echenique, F. et al. "Is school segregation good or bad?." *The American Economic Review*, 2006, 96(2), 265-269.

Hanushek, E.A. "Measuring investment in education." *The Journal of Economic Perspectives*, 1996, 10(4), 9-30.

Hanushek, E.A. "Black-white achievement differences and governmental interventions." *American Economic Review*, 2001, 91(2), 24-28.

Hanushek, E.A. "The Failure of Input-based Schooling Policies*." The Economic Journal, 2003, 113(485), F64-F98.

Hicks, M.J. and V. Rusalkina. "School consolidation and educational performance: An economic analysis of West Virginia high schools." *Center for Business and Economic Research*, Marshall University, Huntington, WV, 2004, 5.

Jacob, B.A. "Public housing, housing vouchers and student achievement: Evidence from public housing demolitions in Chicago." *National Bureau of Economic Research*, Working Paper No. w9652, 2003.

Kane, T.J. and D.O. Staiger. "The promise and pitfalls of using imprecise school accountability measures." *The Journal of Economic Perspectives*, 2002, 16(4), 91-114.

Krieg, J.M. and P. Storer. "How much do students matter? Applying the Oaxaca decomposition to explain determinants of adequate yearly progress." *Contemporary Economic Policy*, 2006, 24(4), 563-581.

Lamdin, D.J. "Evidence of student attendance as an independent variable in education production functions." *The Journal of Educational Research*, 1996, 89(3), 155-162.

Murnane, R.J. and J.P. Papay. "Teachers' views on no child left behind: Support for the principles, concerns about the practices." *The Journal of Economic Perspectives*, 2010, 24(3), 151-166.

Rivkin, S.G. et al. "Teachers, schools, and academic achievement." *Econometrica*, 2005, 73(2), 417-458.

Sirin, S.R. "Socioeconomic status and academic achievement: A meta-analytic review of research." *Review of Educational Research*, 2005, 75(3), 417-453.

VITA

Graduate School

Southern Illinois University

Lisa Breger

lbreger@siu.edu

University of Wisconsin Oshkosh

Bachelor of Arts, Secondary Education, December 2012

Research Paper Title:

Poverty Effects on Student Achievement: A Look at Chicago Public Schools

Major Professor: Alison Watts